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IMPLEMENTATION PLAN REVIEW FOR AMERICAN SAMOA AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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IMPLEMENTATION PLAN REVIEW
FOR
AMERICAN SAMOA
REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

PREPARED BY THE FOLLOWING TASK FORCE:

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U. S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO_2 emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO_2 regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are: 1) the use of the example region approach in developing statewide air quality control strategies; 2) the existence of State air quality standards which are more stringent than NAAQS; and 3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent State air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCR's of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring one percent sulfur oil to be burned statewide where the use of three percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based is the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality standards. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x, and HC emissions which occur in fuel switching, and other potential air pollution problems such as sulfates .

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emissions and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the SO_2 and TSP emission tolerances within each of the various AQCR's. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants) has been carried out in Appendix C.

The American Samoa State Implementation Plan has been reviewed for the most frequent causes of over-restrictive emission limiting regulations. The finding are as follows:

- There is no indication that current regulations are overly restrictive in the context of Section IV of ESECA.
- The Example Region approach was not used in developing control strategies for TSP and SO_2.
- The Territory's ambient air quality standards are identical to the secondary NAAQS.
- Despite the fact that no air quality monitoring data for SO_2 and TSP are available, there are no obvious indications of NAAQS violations because of the limited number of stationary point fuel combustion sources.

2.0 STATE IMPLEMENTATION PLAN REVIEW

2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenace Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on reported (1973) air quality data, does air quality meet NAAQS?
- Based on reported (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of all other sources?
- Is there a significant clean fuels savings potential in the region?
- Must emission regulations be revised to accomplish significant fuel switching?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants) has been carried out in Appendix C.

Based on an overall evaluation of EPA's current information, AQCR's have been classified as good, marginal, or poor candidates for regulation revisions. The following table summarizes the State Implementation Plan Review. The remaining portion of the report supports this summary with explanations.

STATE IMPLEMENTATION PLAN REVIEW
(SUMMARY)

"INDICATORS"	Territory of American Samoa TSP	SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	No	No
• Does the State have emission limiting regulations for control of:		
1. Power plants	Yes	Yes
2. Industrial sources	Yes	Yes
3. Area sources	Yes	Yes
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	No	No
• Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	Yes
• Are there no proposed Air Quality Maintenance Areas?	No	No
• Are there indications of a sufficient number of monitoring sites within a region?	No	No
• Is there an expected 1975 attainment date for NAAQS?	1	1
• Based on reported (1973) Air Quality Data, does air quality meet NAAQS?	N/A	N/A
• Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?	N/A	N/A
• Are the total emissions from stationary fuel combustion sources lower than those of other sources?	Yes[2]	No[2]
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?	N/A	N/A
• Must emission regulations be revised to accomplish significant fuel switching?	N/A	N/A
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?	Poor	Poor
• Is there a significant Clean Fuels Saving potential in the region?	N/A	N/A

N/A = not available
1 = ambient air quality levels were estimated to be below NAAQS at the time the SIP was written.
2 = based on 1970 emission data obtained from the SIP.

2.2 AIR QUALITY SETTING - TERRITORY OF AMERICAN SAMOA

The Territory of American Samoa, consisting of a group of fourteen volcanic tropical islands in the South Pacific Ocean, is contained within one Air Quality Control Region (#245). Presently, the Territory is classified Priority III for all pollutants. There is no proposed Air Quality Maintenance Area designation for any pollutant.

The ambient air quality standards for the Territory are identical to the federal secondary standards and are presented in Table A-4.

No measured air quality data is presently available for the Territory. A Hi-Vol particulate monitor has been installed recently and a SO_2 bubbler monitor will be added by the end of 1974.

The most currently available and detailed emission inventory is for the year 1970 (Tables A-6 and A-7). There are only four point sources in the Territory - one power plant, two fish canneries (Starkist and Van Camps) and one asphalt batching plant (Barber-Green Hot Mix Plant).

2.3 BACKGROUND ON THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

Because no measured air quality data was available at the time the SIP was written, an estimate of the air quality was made by utilizing the Miller-Holzworth area model. This method indicated that sulfur dioxide and particulate concentrations were well below the federal secondary standards. Projection of emissions to the year 1975 showed that the air quality in that year would still remain below the federal secondary standards (Table B-1). Despite these optimistic conclusions, a control strategy was promulgated to prevent excessive degradation of the air quality. Included in the regulations is a "non-degredation" policy.

> "No degredation of the quality of the ambient air shall be permitted in areas in which the concentrations of identified pollutants are lower than the numerical standards established by these regulations unless it has been adequately demonstrated to the Chariman of the

Environmental Quality Commission that a degradation of the air quality in an area is justified as a result of necessary social or economic development and that such lowering of air quality will not seriously interfere with or become injurious to any assigned use made thereof."

2.3.1 Particulate Control Strategy

This portion of the strategy is directed towards visible emission restrictions, release of fugitive dust, control of incineration and fuel burning equipment. As for fuel combustion, an emission limitation of 0.3 lbs particulate matter/million Btu heat input was imposed.

2.3.2 Sulfur Oxide Control Strategy

The only regulation under this strategy is aimed at fuel combustion sources and consists of a 3.5% sulfur (by weight) limit on any fuel sold or burned in the Territory.

3.0 AQCR ASSESSMENTS

3.1 POWER PLANT ANALYSIS

Table C-1 estimates the effect of assuming that the power plant uses the maximum permissible sulfur content fuel (3.5% sulfur). Because the power plant currently burns oil and does not have the capability of using coal without extensive modifications, no analysis was carried out on the effects of switching to coal.

3.2 INDUSTRIAL/COMMERCIAL/INSTITUTIONAL SOURCE ASSESSMENT

No assessment was carried out for the two industrial point sources (fish canneries) because of two factors: (1) the 1975 SO_2 emissions from these sources already assumes that 3.5% sulfur content fuel is used and (2) the boilers of these canneries do not have the capability of burning coal without extensive modifications.

3.3 AREA SOURCE ASSESSMENT

The Territory of American Samoa was found to have no area sources which could be evaluated in the context of Section 4 of ESECA.

3.4 FUEL ASSESSMENT

3.4.1 Energy Supply Potential

The Territory of American Samoa has no natural sources of fossil fuel.

APPENDIX A

- State implementation plan information

Tables in this appendix summarize original state implementation plan information, including priority classifications, attainment dates, ambient air quality standards, and fuel combustion emission regulations.

An emission tolerance, or emission tonnage which might be allowed in the AQCR and still not violate national secondary ambient air quality standards, is shown for SO_2 and particulates in Table A-9. The value of the emission tolerance provides an indication of the degree of potential an AQCR possesses for fuel revisions and regulation relaxation.

It is emphasized that emissions tolerance is a region-wide calculation. This tolerance obviously makes more sense in, say, an urban AQCR with many closely spaced emissions sources than in a largely rural AQCR with geographically dispursed emissions.

Table A-1. American Samoa Air Pollution Control Regions

Air Quality Control Region	Federal Number	Priority Classification[a]			Proposed AQMA Designations[b]	
		Particulates	SO_x	NO_x	TSP Counties	SO_x Counties
American Samoa	245	III	III	III	(0)	(0)

[a]Criteria based on maximum measured (or estimated) pollution concentration ($\mu g/m^3$) in area.

Priority	I	II	III
	Greater than	From-to	Less than
Sulfur oxide			
Annual arithemetic mean	100	60-100	60
24 hour maximum	455	260-455	260
Particulate matter			
Annual geometric mean	95	60-90	60
24 hour maximum	325	150-325	150
Nitrogen Dioxide	110		110

[b]Federal Register, August 1974, SMSA's showing potential for NAAQS violations due to growth.

Table A-2. American Samoa AQCR Population and Area Data

AQCR	County	Area (Square Miles)	1970 Population	Population Density (per Square Mile)
American Samoa	-	76	27,159	357.4

Table A-3. Attainment Dates

AQCR	Name	Particulate Attainment Dates		Sulfur Oxides Attainment Dates		Nitrogen Oxides Attainment Dates
		Primary	Secondary	Primary	Secondary	
245	American Samoa	a	a	a	a	a

[a]Air quality levels presently below standards.

Table A-4. American Samoa Ambient Air Quality Standards

All Concentrations in $\mu g/m^3$

		Total Suspended Particulate		Sulfur Oxides			Nitrogen Dioxide
		Annual	24 Hour	Annual	24 Hour	3 Hour	Annual
Federal	Primary	75 (G)	260[a]	80 (A)	365[a]	-	100 (A)
	Secondary	60 (G)	150[a]	-	-	1300[a]	100 (A)
State		60 (G)	150[a]	-	-	1300[a]	100 (A)

[a]Not to be exceeded more than once a year.

(A) Arithmetic mean.

(G) Geometric mean.

Table A-5. American Samoa Fuel Combustion Source Summary

AQCR	American Samoa Power Plants	Other Fuel Combustion Point Sources[a]
American Samoa	1	2

[a]All fuel combustion point sources in American Samoa included.

Table A-6. American Samoa Emission Summary, Particulates[a]

AQCR	Total (Tons/Year)	Electrical Generation Tons/Year	%	Industrial, Institutional, Commercial Point Source Fuel Combustion Tons/Year	%	Area Source Fuel Combustion Tons/Year	%	Other Sources of Part. Emissions Tons/Year	%
American Samoa	175	22.5	13	14.4	8.2	0	0	138.1	78.8

[a]1970 data from SIP.

Table A-7. American Samoa Emission Summary, SO_2[a]

AQCR	Total (Tons/Year)	Electrical Generation Tons/Year	%	Industrial, Institutional, Commercial Point Source Fuel Combustion Tons/Year	%	Area Source Fuel Combustion Tons/Year	%	Other Sources of SO_2 Emissions Tons/Year	%
American Samoa	510	167	33	333	65	0	0	10	2

[a]1970 data from SIP.

Table A-8. American Samoa Fuel Combustion Regulations

Particulates: 0.3 lbs/10^6 Btu heat input.

Sulfur oxides: Limit of 3.5% sulfur (by weight) in any fuel burned.

Table A-9. American Samoa Required Emission Reductions

AQCR	Air Quality which SIP Was Based on[a] TSP ($\mu g/m^3$) Annual	Air Quality which SIP Was Based on[a] SO_2 ($\mu g/m^3$) Annual	% Rollback Required Part.	% Rollback Required SO_2	1970 Emissions[b] (Tons/Year) Part.	1970 Emissions[b] (Tons/Year) SO_2	1975 Estimated Air Quality[b] ($\mu g/m^3$) TSP	1975 Estimated Air Quality[b] ($\mu g/m^3$) SO_2	Estimated 1975 Emissions[b] (Tons/Yr) Part.	Estimated 1975 Emissions[b] (Tons/Yr) SO_2	% Tolerance for Emission Increase in 1975[a] Part.	% Tolerance for Emission Increase in 1975[a] SO_2
245	44.6	13.3	-335	-500	157	510	45.8	22.6	220	868	244	254

[a]Estimated

[b]From SIP

[c]Calculated from proportional rollback (background particulate concentration assumed to be 40 $\mu g/m^3$, same as in 1970)

APPENDIX B

Table B-1. Territory of American Samoa Candidacy Assessment for Revision of Particulate Regulations

AQCR	# of Monitors	# of Monitors with Violations	Expected Attainment Date	Counties with Proposed AQMA Designations?	1970 Total Emissions (Tons/Year)	% Emission from Fuel Combustion	Tolerance for Emission Increase[b] (Tons/Year)	Overall Regionwide Evaluation
American Samoa	0	0	a	No	175	21.2	273	Poor Candidate

[a]Air quality levels estimated to be below standards.

[b]Increase from projected 1975 emission levels.

Table B-2. Territory of American Samoa Candidacy Assessment for Revision of SO_2 Regulations

AQCR	SO_2 Air Quality Violations # of Monitors	# of Monitors with Violations	Expected Attainment Date	Counties with Proposed AQMA Designations?	1970 Total Emissions (Tons/Year)	% Emission from Fuel Combustion	Tolerance for Emission Increase[b] (Tons/Year)	Overall Regionwide Evaluation
American Samoa	0	0	a	No	510	98	1337	Poor Candidate

[a]Air quality levels estimated to be below standards

[b]Increase from projected 1975 emission levels.

APPENDIX C

This section is a review of individual power plants by AQCR. The intent is to illustrate fuel switching possibilities and SO_2 emissions resulting from these switches on an individual plant basis.

Table C-1. American Samoa Power Plant Analysis

AQCR	Plant Capacity	Fuel Characteristics (1970)[a] Type % S % A	Annual Quantity	Heat Input (10^6 Btu/Hr)	Emissions (1970)[a] SO_2 Part. NO_x Tons/Yr	Lbs/10^6 Btu	1975 Emission Limit Part.	SO_2
American Samoa	Govt. of Samoa Power Plant ?	Oil 0.7 % S	2.993 x 10^6 Gal.	52	167 23 43	0.7 0.1 0.2	0.1 lb/ 10^6Btu	3.5 % S

Fuel Characteristics (1975)[a] Type % S % A	Annual Quantity	Heat Input (10^6 Btu/Hr)	SIP Projected Emissions (1975)[a] SO_2 Part. Tons/Yr	Lbs/10^6 Btu	1975 Emissions if 3.5% Fuel is Used (Tons/Yr) SO_2
Oil	7.02 x 10^6 Gal.	122	388 53	0.7 0.1	1940

[a]Data from SIP.

BIBLIOGRAPHY

(1) "1972 National Emissions Report," U.S. Environmental Protection Agency, EPA-450/2-74-012.

(2) "Projections of Economic Activity for Air Quality Control Regions," U.S. Department of Commerce, Bureau of Economic Analysis, Prepared for U.S. EPA, August 1973.

(3) "Monitoring and Air Quality Trends Report, 1972," U.S. EPA - 450/1-73-004.

(4) "Steam-Electric Plant Factors/1072," 22nd Edition National Coal Association.

(5) "Federal Air Quality Control Regions," U.S. EPA, Pub. No. AP102.

(6) "Assessment of the Impact of Air Quality Requirements on Coal in 1975, 1977 and 1980," U.S. Department of the Interior, Bureau of Mines, January 1974.

(7) "Fuel and Energy Data," U.S. Department of Interior Bureau of Mines. Government Printing Office, 1974, 0-550-211.

(8) "Compilation of Air Pollutant Emission Factors, 2nd Edition," U.S. EPA, Air Pollution Tech., Pub. AP-42, April 1973.

(9) SAROAD Data Bank, 1973 Information, U.S. EPA.

(10) Federal Power Commission, U.S. Power Plant Statistics Stored in EPA Data Bank, September 1974.

(11) "Territory of American Samoa Air Pollution Control Implementation Plan," January 27, 1972.